FILE COPY

Lancaster Laboratories

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Analysis Report

ANALYTICAL RESULTS

Prepared by:

Lancaster Laboratories
2425 New Holland Pike
Lancaster, PA 17605-2425

Prepared for:

Olin Corporation
Suite 200
3855 North Ocoee Street
Cleveland TN 37312

June 17, 2011

Project: Olin Wilmington, MA Superfund Site/6107090016

Submittal Date: 06/09/2011
Group Number: 1250628
SDG: OLN72
PO Number: REWI0012
Release Number: ERRE9813
State of Sample Origin: MA

Client Sample Description	Lancaster Labs (LLI) #
OC-SS-448-0.0/1.0-DUP Grab Soil	6310728
OC-SS-448-0.0/1.0-XXX Grab Soil	6310729
OC-SS-448-0.0/1.0-XMS Grab Soil	6310730
OC-SS-448-0.0/1.0-MSD Grab Soil	6310731

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC COPY TO	MACTEC	Attn: Kelly Chatterton
ELECTRONIC COPY TO	MACTEC	Attn: Chris Ricardi
ELECTRONIC COPY TO	Olin Chemicals	Attn: James Cashwell
ELECTRONIC COPY TO	Data Package Group	

Lancaster Laboratories

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Analysis Report

Questions? Contact your Client Services Representative
Nicole L Maljovec at (717) 656-2300 Ext. 1537

Respectfully Submitted,

Dorothy M. Love

Dorothy M. Love
Group Leader

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Analysis Report

Sample Description: OC-SS-448-0.0/1.0-DUP Grab Soil
Wilmington MA Superfund Site

LLI Sample # SW 6310728
LLI Group # 1250628
Account # 12670

Project Name: Olin Wilmington, MA Superfund Site/6107090016

Collected: 06/08/2011 09:35

Submitted: 06/09/2011 09:05
Reported: 06/17/2011 14:11

Olin Corporation
Suite 200
3855 North Ocoee Street
Cleveland TN 37312

448-D SDG#: OLN72-01FD

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
Misc. Organics	**SW-846 8315A modified**		**ng/g**	**ng/g**	**ng/g**	
10346	1,1-Dimethylhydrazine	57-14-7	N.D.	5.3	2.1	1
10346	Hydrazine	302-01-2	2.5	2.1	0.53	1
10346	Methylhydrazine	60-34-4	N.D.	5.3	2.1	1
Wet Chemistry	**SM20 2540 G**		**%**	**%**	**%**	
00111	Moisture	n.a.	6.2	0.50	0.50	1

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10346	Hydrazines in Soil	SW-846 8315A modified	1	11165002	06/16/2011 00:03	Meng Yu	1
00111	Moisture	SM20 2540 G	2	11165820002B	06/14/2011 19:21	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: OC-SS-448-0.0/1.0-XXX Grab Soil
Wilmington MA Superfund Site

LLI Sample # SW 6310729
LLI Group # 1250628
Account # 12670

Project Name: Olin Wilmington, MA Superfund Site/6107090016

Collected: 06/08/2011 09:35

Submitted: 06/09/2011 09:05
Reported: 06/17/2011 14:11

Olin Corporation
Suite 200
3855 North Ocoee Street
Cleveland TN 37312

448-1 SDG#: OLN72-02BKG

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
Misc. Organics	**SW-846 8315A modified**		**ng/g**		**ng/g**	**ng/g**	
10346	1,1-Dimethylhydrazine	57-14-7	N.D.		5.3	2.1	1
10346	Hydrazine	302-01-2	1.7	J	2.1	0.53	1
10346	Methylhydrazine	60-34-4	N.D.		5.3	2.1	1
Wet Chemistry	**SM20 2540 G**		**%**		**%**	**%**	
00111	Moisture	n.a.	6.5		0.50	0.50	1

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10346	Hydrazines in Soil	SW-846 8315A modified	1	11165002	06/15/2011 23:43	Meng Yu	1
00111	Moisture	SM20 2540 G	2	11165820002B	06/14/2011 19:21	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: OC-SS-448-0.0/1.0-XMS Grab Soil
Wilmington MA Superfund Site

LLI Sample # SW 6310730
LLI Group # 1250628
Account # 12670

Project Name: Olin Wilmington, MA Superfund Site/6107090016

Collected: 06/08/2011 09:35

Submitted: 06/09/2011 09:05
Reported: 06/17/2011 14:11

Olin Corporation
Suite 200
3855 North Ocoee Street
Cleveland TN 37312

448-1 SDG#: OLN72-02MS

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
Misc. Organics	**SW-846 8315A modified**		**ng/g**	**ng/g**	**ng/g**	
10346	1,1-Dimethylhydrazine	57-14-7	59	5.3	2.1	1
10346	Hydrazine	302-01-2	15	2.1	0.53	1
10346	Methylhydrazine	60-34-4	54	5.3	2.1	1
Wet Chemistry	**SM20 2540 G**		**%**	**%**	**%**	
00118	Moisture	n.a.	6.5	0.50	0.50	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10346	Hydrazines in Soil	SW-846 8315A modified	1	11165002	06/16/2011 01:45	Meng Yu	1
00118	Moisture	SM20 2540 G	2	11165820002B	06/14/2011 19:21	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: OC-SS-448-0.0/1.0-MSD Grab Soil
Wilmington MA Superfund Site

LLI Sample # SW 6310731
LLI Group # 1250628
Account # 12670

Project Name: Olin Wilmington, MA Superfund Site/6107090016

Collected: 06/08/2011 09:35

Submitted: 06/09/2011 09:05
Reported: 06/17/2011 14:11

Olin Corporation
Suite 200
3855 North Ocoee Street
Cleveland TN 37312

448-1 SDG#: OLN72-02MSD*

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
Misc. Organics	**SW-846 8315A modified**		**ng/g**	**ng/g**	**ng/g**	
10346	1,1-Dimethylhydrazine	57-14-7	60	5.3	2.1	1
10346	Hydrazine	302-01-2	13	2.1	0.53	1
10346	Methylhydrazine	60-34-4	39	5.3	2.1	1
Wet Chemistry	**SM20 2540 G**		**%**	**%**	**%**	
00118	Moisture	n.a.	6.5	0.50	0.50	1
00121	Moisture Duplicate	n.a.	6.1	0.50	0.50	1

The duplicate moisture value is provided to assess the precision of the moisture test. For comparability purposes, the initial moisture determination is the value used to perform dry weight calculations.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10346	Hydrazines in Soil	SW-846 8315A modified	1	11165002	06/16/2011 02:05	Meng Yu	1
00118	Moisture	SM20 2540 G	2	11165820002B	06/14/2011 19:21	Scott W Freisher	1
00121	Moisture Duplicate	SM20 2540 G	2	11165820002B	06/14/2011 19:21	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Lancaster Laboratories

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Analysis Report

Quality Control Summary

Client Name: Olin Corporation Group Number: 1250628
Reported: 06/17/11 at 02:11 PM

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank LOQ**	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 11165002	Sample number(s): 6310728-6310731								
1,1-Dimethylhydrazine	N.D.	5.0	2.0	ng/g	86	91	70-130	6	30
Hydrazine	N.D.	2.0	0.50	ng/g	77	95	70-130	21	30
Methylhydrazine	N.D.	5.0	2.0	ng/g	71	80	70-130	13	30
Batch number: 11165820002B	Sample number(s): 6310728-6310731								
Moisture					100		99-101		
Moisture					100		99-101		
Moisture Duplicate					100		99-101		

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Batch number: 11165002	Sample number(s): 6310728-6310731 UNSPK: 6310729								
1,1-Dimethylhydrazine	9*	9*	10-116	1	30				
Hydrazine	10*	9*	11-102	9	30				
Methylhydrazine	8*	6*	10-92	33*	30				
Batch number: 11165820002B	Sample number(s): 6310728-6310731 BKG: 6310729								
Moisture						6.5	6.1	7	15
Moisture						6.5	6.1	7	15
Moisture Duplicate						6.5	6.1	7	15

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

A12670/1250628/6310728-31

Soil Program

Client:	Olin Corporation	Client Project #:	6107090016
Address:	3855 North Ocoee St. Suite 200	Work Site ID:	Wilmington, MA
	Cleveland, TN 37312	Reports Sent To:	Steve Morrow
Phone:	423-336-4511	Fax:	423-336-1466
Email	SGMorrow@olin.com	Email Rpt:	

Requested Turnaround Time (SPECIFY): Standard____ Rush____ (Lab Approval Required)

Regulatory Programs: MADEP MCP____ Superfund ____

Report Requirements Level IV Package ____ Level II Package ____

EDD Requirements: MACTEC EQUIS EZ EDD

INVOICE INFO — Shaded Areas for office use only

Company Name: Olin Corp

Company Contact: ERG Accounts Payable

Address: Same as Client

Phone: Email

Job # _____ Quote # _____

Lab SDG # _____ PO # _____

MACTEC

Sample ID	Date/Time Collected	Fraction (1)	QC Code (2)	Sample Matrix (3)	Composite (C) or Grab (G)	Total # of Containers	Cr+6 (3060A / 7199)	Cr+6 (7199)	DMF (Mod 8033 - GC/NPD)	DMF (Mod 8033 - GC/NPD)	Opex / Kempore (8000B - HPLC)	Perchlorate (6850)	Hydrazine, MMH, UDMH (Mod 8315 LC/MS/MS)	Hydrazine, MMH, UDMH (Mod 8315 LC/MS/MS)	<--Preservative Type (4) <--Bottle Type (5)	Comments (Special Instructions)
							G	P	G	V	V	V	AG	Zn AV		
OC-SS-448-0.0/1.0-DUP	6/8/2011 9:35:00 AM	T	FD	SO	G	1							X			Shipped on ICE

Lancaster Lab

Page 1 of 2

Special Instructions For Lab

Notes:

1.) Fraction: T = Total, D = Dissolved, S = SPLP, C = TCLP, N = Not Applicable

2.) QC Codes: FS = Field Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike, MSD = Matrix Spike Duplicate, PE = Performance Evaluation Sample, FB = Field Blank

3.) Sample Matrix: GW = Groundwater, SW = Surface Water, DW = Drinking Water SO = Soil, SD = Sediment, BW = Blank Water, NAL = Non-Aqueous Liquid, PR = Product, O = Oil

4.) Preservation Type: HA = Hydrochloric Acid, NI = Nitric Acid, SA = Sulfuric Acid, SH = Sodium Hydroxide, Zn = Zinc Acetate, ME = Methanol, DI = DI Water

5.) Bottle Type: G = Glass, P = Plastic, V = 40mL VOA Glass Vial, AG = Amber Glass, AV = 40mL VOA Amber Glass Vial.

Cooler ? Y / N — MADEP Requirement Samples Iced? Y / N

Temp @ receipt: 1.8 Deg C

Preservation / pH checked? Y / N

By: _____ Date: _____

Relinquished: [signature] **Date:** 6/8/11 **Time:** 1500 **Received:** _____ **Date:** __/__/__ **Time:** _____

Relinquished: _____ **Date:** __/__/__ **Time:** _____ **Received:** [signature] **Date:** 6/9/11 **Time:** 905

ONE Cooler Shipped Fed Ex P1 tracking #: 8673 8250 3816

A12670/1250628/6310728-31

Soil Program

MACTEC

Sample ID	Date/Time Collected	Fraction (1)	QC Code (2)	Sample Matrix (3)	Composite (C) or Grab (G)	Total # of Containers	G	P	G	V	V	V	AG	Zn AV	<--Preservative Type (4) <--Bottle Type (5)	Comments (Special Instructions)
							Cr+6 (3060A / 7196)	Cr+6 (7199)	DMF (Mod 8033 - GC/NPD)	DMF (Mod 8033 - GC/NPD)	Opex / Kempore (8000B - HPLC)	Perchlorate (6850)	Hydrazine, MMH, UDMH (Mod 8315 LC/MS/MS)	Hydrazine, MMH, UDMH (Mod 8315 LC/MS/MS)		
OC-SS-448-0.0/1.0-MSD	6/8/2011 9:35:00 AM	T	MS	SO	G	1							X			Shipped on ICE
OC-SS-448-0.0/1.0-XMS	6/8/2011 9:35:00 AM	T	MS	SO	G	1							X			↓ Lancaster Lab
OC-SS-448-0.0/1.0-XXX	6/8/2011 9:35:00 AM	T	FS	SOIL	G	1							X			Page 2 of 2

Special Instructions For Lab

Notes:

1.) Fraction: T = Total, D = Dissolved, S = SPLP, C = TCLP, N = Not Applicable

2.) QC Codes: FS = Field Sample, TB = Trip Blank, FD = Field Duplicate, ED = Equipment Blank, MS = Matrix Spike, MSD = Matrix Spike Duplicate, PE = Performance Evaluation Sample, FB = Field Blank

3.) Sample Matrix: GW = Groundwater, SW = Surface Water, DW = Drinking Water SO = Soil, SD = Sediment, BW = Blank Water, NAL = Non-Aqueous Liquid, PR = Product, O = Oil

4.) Preservation Type: HA = Hydrochloric Acid, NI = Nitric Acid, SA = Sulfuric Acid, SH = Sodium Hydroxide, Zn = Zinc Acetate, ME = Methanol, DI = DI Water

5.) Bottle Type: G = Glass, P = Plastic, V = 40mL VOA Glass Vial, AG = Amber Glass, AV = 40mL VOA Amber Glass Vial.

Relinquished:		**Date:** 6/8/11	**Time:** 1500	**Received:**	**Date:** / /	**Time:**
Relinquished:		**Date:** / /	**Time:**	**Received:**	**Date:** 6/9/11	**Time:** 905

Cooler ? Y / N	MADEP Requirement
	Samples Iced? Y / N
Temp @ receipt: 1.8 Deg C	
Preservation / pH checked? Y / N	
By: _____	Date: _____

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
ug	microgram(s)	**mg**	milligram(s)
ml	milliliter(s)	**l**	liter(s)
m3	cubic meter(s)	**ul**	microliter(s)

< less than - The number following the sign is the limit of quantitation, the smallest amount of analyte which can be reliably determined using this specific test.

> greater than

J estimated value – The result is ≥ the Method Detection Limit (MDL) and < the Limit of Quantitation (LOQ).

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

U.S. EPA CLP Data Qualifiers:

Organic Qualifiers

A	TIC is a possible aldol-condensation product
B	Analyte was also detected in the blank
C	Pesticide result confirmed by GC/MS
D	Compound quantitated on a diluted sample
E	Concentration exceeds the calibration range of the instrument
N	Presumptive evidence of a compound (TICs only)
P	Concentration difference between primary and confirmation columns >25%
U	Compound was not detected
X,Y,Z	Defined in case narrative

Inorganic Qualifiers

B	Value is <CRDL, but ≥IDL
E	Estimated due to interference
M	Duplicate injection precision not met
N	Spike sample not within control limits
S	Method of standard additions (MSA) used for calculation
U	Compound was not detected
W	Post digestion spike out of control limits
*****	Duplicate analysis not within control limits
+	Correlation coefficient for MSA <0.995

Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.